

The **Ground Water Investigation Program (GWIP)** answers locally identified, site-specific questions prioritized by the Montana Ground Water Steering Committee (MCA 85-2-525). As mandated by the Montana Legislature, GWIP conducts research on the most urgent water issues in the State.



Groundwater monitoring

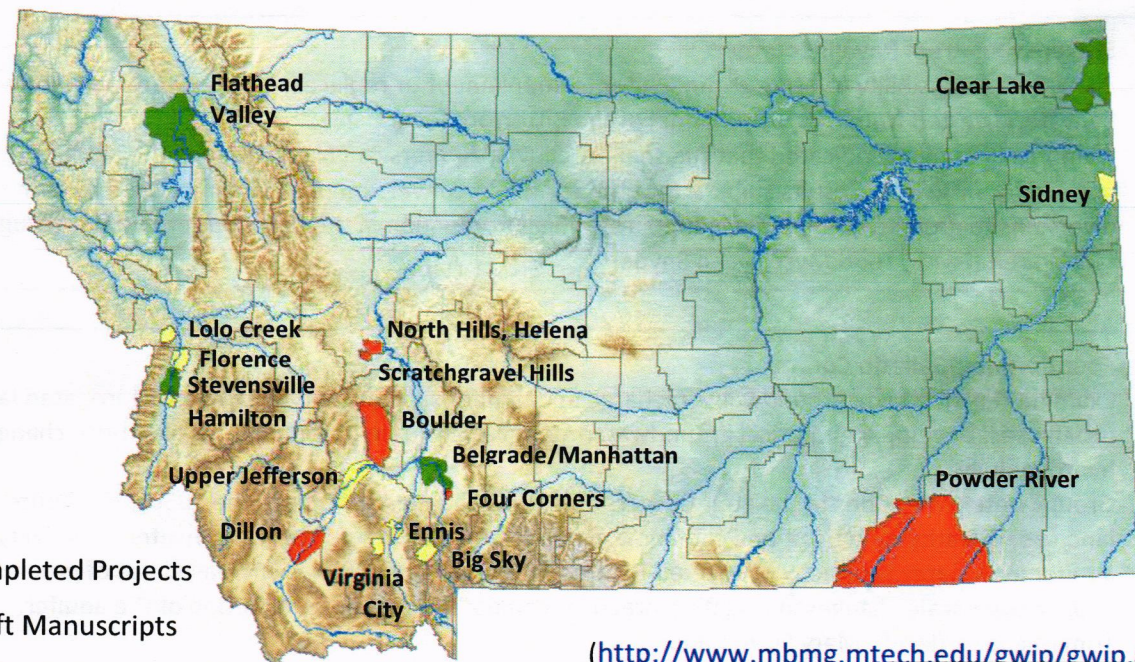


Groundwater/Surface water interactions; measuring canal and stream flows



Water chemistry

GWIP PROJECT MAP



(<http://www.mbmgt.mtech.edu/gwin/gwin.asp>)

WATER POLICY INTERIM
COMMITTEE 2017-18



MONTANA BUREAU OF MINES AND GEOLOGY

Ground Water Investigation Program

ACTIVE PROJECT SUMMARIES (2016–2017)

PROJECT COMPLETED IN 2016

Project: Boulder River Valley; Jefferson County (MBMG Open-File Reports 682 and 688)
Purpose: Evaluate the effects of current and projected future groundwater withdrawals and the potential to use managed recharge to supplement late summer flows.
Results: Modeling residential development scenarios shows that the magnitude of stream depletion from groundwater withdrawals is directly proportional to the pumping rate, and over the long term, the amount of water removed is offset by decreased groundwater discharge to streams. Managed recharge is a viable option but requires consideration of water quality, water rights, and economics.
Personnel: Andy Bobst (Lead), Julie Butler

PROJECTS WITH DRAFT MANUSCRIPTS COMPLETED IN 2016

Project: Clear Lake Aquifer; Sheridan County
Purpose: Evaluate Clear Lake aquifer response to groundwater withdrawals and provide analyses that will be used to assess development and wildlife decisions.
Results: There is no hydraulic connection between the aquifer and Medicine Lake. Model scenarios indicate that moderate additional irrigation development in the South Medicine Lake area is unlikely to significantly impact wetlands or streamflow in Big Muddy Creek.
Personnel: Jon Reiten (Lead), Kevin Chandler

Project: Stevensville Area; Ravalli County
Purpose: Evaluate the feasibility of using groundwater to supplement or replace irrigation water currently supplied by water diverted from the East Channel of the Bitterroot River.
Results: Numerical modeling indicated that the shallow alluvial aquifers can likely produce the amounts of water needed for irrigation. Results suggest that the complete conversion of all lands serviced by surface-water diversions to groundwater would lead to a significant reduction in the flows out of Mitchell Slough.
Personnel: Kirk Warren (Lead), Todd Myse, Dean Snyder

Project: Four Corners; Gallatin County
Purpose: Examine the effects on groundwater recharge and aquifer sustainability of converting irrigated lands to urban uses. Develop a numerical groundwater model to evaluate potential future land-use changes on the hydrogeology.
Results: Groundwater conditions in the Four Corners area have changed little since the 1950s, but future changes in land use, irrigation practices, and climatic conditions are likely to reduce groundwater availability. The aquifer in this area is directly connected to streams and irrigation water. Increased use of groundwater and/or large-scale changes in irrigation practices can potentially cause depletion of the aquifer.
Personnel: Tom Michalek (Lead), Mary Sutherland

DRAFT MANUSCRIPTS COMPLETED IN 2016 (CONT.)

Project: Kalispell Area; Flathead County
Purpose: Determine whether withdrawals from the deep aquifer affect surface-water resources; and (if current stresses are creating declining water-level trends.
Results: Pumping appears to have created water-level declines in limited areas, but not valley-wide. The confining unit is interpreted to be effective at protecting the deep aquifer from contamination and constraining pumping drawdown to the aquifer. A 3-dimensional hydrostratigraphic model has been constructed and will allow future users to access lithologic information for any location in the valley.
Personnel: John Wheaton (Lead), James Rose

PROJECTS THAT ARE ACTIVE

Project: Hamilton Area; Ravalli County
Purpose: Examine the effects on groundwater and surface water of current and potential future groundwater withdrawals from residential/subdivision development.
Status: Data collection was completed in spring 2016. Data interpretation and report writing started in fall 2016. Development of a groundwater flow model will commence fall 2017 to further evaluate the effects of current and future housing development on water resources.
Personnel: Todd Myse (Lead), Dean Snyder, Ginette Abdo

Project: Big Sky; Gallatin and Madison Counties
Purpose: Evaluate the sustainability and production capacity of the Meadow Village aquifer and the feasibility of groundwater withdrawals from bedrock aquifers in the Big Sky area.
Status: Groundwater and surface-water monitoring was completed in spring 2016. Data collected from 15 monitoring wells installed for the project will be used to refine the numerical model of the sand and gravel aquifer, and to evaluate how current and future water demands will affect groundwater and surface-water availability. An interpretive report for the larger Big Sky area will include a conceptual hydrogeologic model for the bedrock aquifers.
Personnel: Kirk Waren (Lead), James Rose

Project: Upper Jefferson River Valley; Jefferson, Madison, and Silver Bow Counties
Purpose: Evaluate the effects of current and potential future groundwater withdrawals and changes in land use on baseflow to Willow Springs, Parson's Slough, Jefferson Slough, and the Jefferson River.
Status: Data collection is complete. Data interpretation, numerical modeling, and report preparation are underway. Two groundwater models are being developed to assess the influence of land-use change on groundwater and surface water. One model (Waterloo area) has been completed and the other (Whitehall area) is being developed.
Personnel: Andy Bobst (Lead), Ali Gebril

Project: Manhattan/Belgrade; Gallatin County
Purpose: Determine if groundwater levels or the annual groundwater flow has declined in response to pumping pressures and land-use change over the past 60 years. Examine potential effects of future groundwater development on groundwater and surface water. Investigate changes in groundwater quality that may be related to increased wastewater disposal.
Status: Data collection is complete. Data interpretation, numerical modeling, and report preparation are underway. Numerical modeling will be used to evaluate the effects of high-capacity wells on groundwater and surface water.
Personnel: Tom Michalek (Lead), Mary Sutherland

PROJECTS THAT ARE ACTIVE (CONT.)

Project: Lolo Creek; Missoula County

Purpose: Determine the cause(s) of changes in streamflow character that have occurred in the lowest reaches of Lolo Creek and have resulted in the channel occasionally being dry.

Status: Interpreting the cause of dry episodes will better allow for identification and implementation of effective water-management strategies. Dry creek episodes may be influenced by climate, water withdrawn from the creek, groundwater pumping, changes in surface storage and groundwater recharge, and geomorphological changes. Data collection ongoing through December 2017.

Personnel: John Wheaton (Lead), Cam Carstarphen, Ali Gebril

Project: Virginia City; Madison County

Purpose: Estimate sustainability of the public water supply springs under scenarios of increasing demand and adjacent future development. Investigate the potential of augmenting the municipal springs with a well(s).

Status: Data collection began in March 2017. Geologic mapping, LiDAR collection, monitoring well drilling, groundwater and surface-water monitoring, and sampling will be conducted during the 2017 field season. The information collected during 2017 will be used to evaluate the source of the springs, and to identify potential well sites for future development.

Personnel: Andy Bobst (Lead), Tom Michalek

Project: Lower Yellowstone Buried Valley Aquifer; Richland County

Purpose: Determine the availability of water from the Lower Yellowstone Buried River Channel aquifer in the Sidney area and the aquifer's ability to meet the needs for future municipal water and oil and gas development water.

Status: Field work will begin during summer 2017. Data collection includes test drilling to define hydrostratigraphic conditions, groundwater monitoring, and compiling current water-use estimates. A numerical groundwater model will be used to verify hydrogeologic conditions, make predictions on water use, and be used as a water management tool.

Personnel: Jon Reiten(Lead), Kevin Chandler

Project: Ennis Area; Madison County

Purpose: Investigate the effects of increased residential development and groundwater withdrawals in the bedrock aquifer on the west side of the Ennis Valley. Implications for increased withdrawals on adjacent aquifers will be considered.

Status: Existing well logs and aquifer tests are being reviewed; data collection will begin late summer 2017.

Personnel: Andy Bobst (Lead), Mary Sutherland

GWIP PROGRAM INFORMATION

GINETTE ABDO (PROGRAM MANAGER)

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